

BAA 03-36

Integrated Sensor Is Structure (ISIS)
Proposer Information Pamphlet

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U.S. Department of Defense
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Coordinating Point of Contact:
Dr. Larry Corey
703-248-1513 (voice)
703-516-7360 (fax)
lcorey@darpa.mil

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1 INTRODUCTION

The Defense Advanced Research Projects Agency (DARPA) often solicits research efforts through the Broad Agency Announcement (BAA). The BAA is announced in the Federal Business Opportunities (FedBizOpps), a website (www.fedbizopps.gov) sponsored by the General Services Administration (GSA). This Proposer Information Pamphlet (PIP) is for parties interested in responding to DARPA BAA 03-36, Integrated Sensor Is Structure (ISIS). Prospective offerors must refer to this PIP before submitting a proposal. This PIP, along with the FedBizOpps announcement, constitutes a Broad Agency Announcement (BAA) as contemplated in FAR 6.102 (d)(2)(i). This BAA does not commit the Government to pay for any response preparation cost. The cost of preparing proposals in response to the BAA is not considered an allowable direct charge to any other contract. However, it may be an allowable expense as specified in FAR 31.205-18.

2 ISIS PROGRAM VISION, GOAL, AND BACKGROUND

2.1 ISIS Vision

The combination of emerging technologies in lightweight low power density phased array antenna components, power generation and storage, and unmanned stratospheric airship platforms will enable the development of a new class of battlefield sensors with capabilities orders of magnitude better than any existing or planned sensor system. It is envisioned that the ISIS radar sensors operating from a single, high altitude, stationary platform will be capable of detecting and tracking all airborne targets and all ground based targets, including dismounted troops, while simultaneously providing wideband communications to the battlefield. The envisioned ISIS system will be capable of dynamically re-allocating its resources between the air, ground, and communication activities as battlefield conditions change. The envisioned ISIS system will have a minimal logistics tail and be completely free from dependence on a local airport and aircrew.

The large airship platform along with the lightweight low power density antenna technology will enable ISIS to have antenna nearly as large as the cross-sectional area of the airship which will create unprecedented power aperture (PA) product potential. The ISIS platform will be at an altitude of ~ 70,000 feet, it will be stationary, and it will be able to stay on station continuously for up to one year. The huge PA, high altitude, stationary, and persistent ISIS system will be capable of detecting, tracking and engaging large number low flying airborne targets out to the radar horizon and large numbers of dismounted troops and other ground targets, moving less than 1 m/s, and with grazing angles better than 3° out to 300 km. ISIS will provide continuous surveillance of both the air and ground with very short frame time while simultaneously tracking and engaging targets with high update rates. The long term persistence will allow ISIS to develop extremely detailed clutter maps, determine normal traffic patterns, recognize unusual situations, continuously monitor regions of high interest, associate dismounted troops

with vehicles or buildings, and provide continuous communications. Figure 1 shows a possible concept of operation.

2.2 ISIS Goal

The three technology areas that are critical to realization of the ISIS vision are the extremely large, light weight, low-power-density phased-array antenna, the airship into which this antenna is integrated, and the power system that supplies the radar and engines. Use of existing technologies would yield a heavy system that far exceeds the airship lift budget. Weight reduction is necessary in each technology area, but integration is also necessary so that the remaining mass serves multiple functions.

The goal of the ISIS program is to identify a feasible implementation of the ISIS vision, to develop the necessary enabling technologies, and to demonstrate those technologies. This BAA currently addresses only the first step in that goal, a one-year study to identify a feasible solution path.

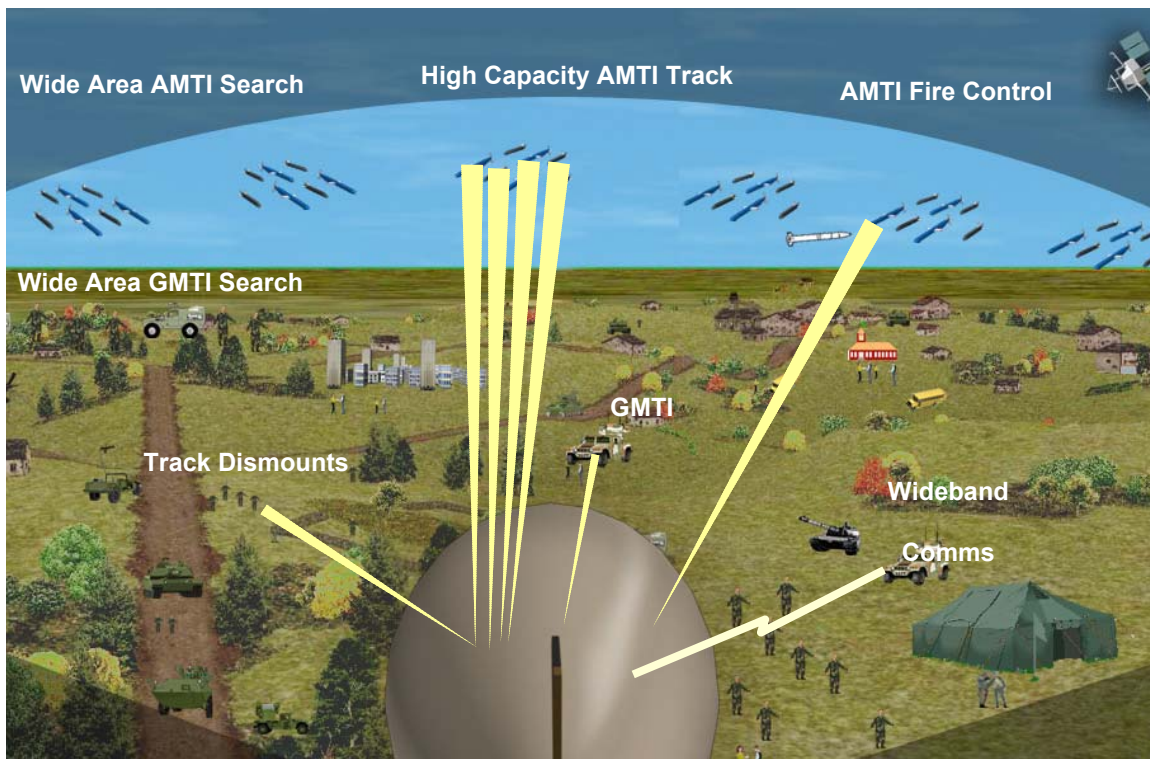


Figure 1. ISIS Concept of Operation

2.3 ISIS Technology Background

An unmanned airship can potentially provide a persistent, stationary platform at 70,000 feet with room for an ultra-large phased array aperture. However, airship lift is determined by the weight of displaced air and air density at 70,000 feet altitude is only 1/20th of that at sea level. Therefore, airship lift at altitude is extremely limited. ISIS

might operate continuously over extended periods of time by using solar power during the day and storing energy for night time operation. Current and emerging technologies for energy collection and storage will provide limited prime power for the ISIS sensors. As a result, the ISIS sensors will need to be designed to be very light and not use large amounts of power.

2.3.1 Lightweight Low Power Density Antennas

DARPA studies have shown that a given radar PA requirement can be met with minimum system weight through use of large aperture and low radiated power. This approach cannot be used in conventional airborne platforms since the maximum aperture area is constrained by the platform. As the ISIS radar aperture grows, the weight increase resulting from a larger antenna is more than offset by the weight decrease from a reduced prime power requirement. Low power spread over a large aperture results in an antenna with extremely low power density. Low-power-density antennas offer the potential of extremely low weight density due to minimal cooling requirements and elimination of heavy high-power electronics.

The ISIS system lift budget will limit the antenna areal density (kg/m^2) to less than one tenth that of today's lightest space-based antenna technology. This reduction is possible since the ISIS antenna does not need to be stowed and deployed, does not need to survive launch, and does not need radiation shielding.

At these low power levels, system on a chip technologies based on SiGe may be used to obtain high levels of electronics integration. This approach may reduce electronics to a single chip per array antenna element, or it may be possible to extend the integration to an entire wafer. These higher levels of integration minimize the overhead weight of packaging and interconnections.

In order to achieve the desired airborne surveillance and tracking performance at maximum range, ISIS will likely require a dual-band radar (e.g. VHF and X-band). If a dual-band approach is taken, both radar bands should utilize a single "shared aperture" antenna.

Ultra-large lightweight phased-array antennas are somewhat flexible and will change shape during operation. This will create a need for dynamic calibration techniques to keep the energy transmitted and received coherent over the entire aperture and keep the beam pointed in the desired direction.

2.3.2 Integrated ISIS System

The aperture of the ISIS sensor may be nearly as large as the cross section of the airship. Therefore, it will not be possible to design an airship and then install the sensor. The sensors, the power collection and storage system, and the airship must be an integrated system. In order to maximize the PA of ISIS, it will be necessary to use the limited lift capability as efficiently as possible. This means looking for every opportunity to use the same mass for more than one function. Examples would be to use mechanical support

structure as energy storage using fiber battery technologies, integrating two radar band sensors into the same apertures area, or possibly integrating sensor radiators and solar collectors into the same area.

2.3.3 Power System

During normal conditions, most of the ISIS system power will be consumed by the radar. During peak wind events, station keeping will require more power than the radar. To minimize power system requirements, both the radar and the station keeping approach must be developed to minimize power requirements.

2.4 Required and Flexible Aspect of ISIS

Based on DARPA's background studies, certain aspects of the ISIS system have been categorized as required while other are flexible.

2.4.1 Required

2.4.1.1 Performance

The ISIS system must detect and track airborne and ground targets and provide battlefield communications and it must be capable of re-configuring itself to allocate the proper resources to each mission as the situation on the battlefield changes. The radar capabilities must be far better than those achievable from current or planned sensor systems. Airborne radar performance should extend at least to the radar horizon, whereas ground target performance may taper off beyond 300 km. Search functions should cover the complete volume and ground area to these ranges, within some maximum altitude and sector width. Exact performance requirements have not been quantified. The maximum potential capabilities should be determined.

2.4.1.2 Persistence

The system must be able to maintain sensor operation for a year. Sensor availability may be occasionally interrupted for short periods. Radar availability on station of roughly 99% (long-term average) is desired.

2.4.1.3 Minimal Logistics Tail

The ISIS system must have a logistics tail that is very small compared to conventional transportable radar systems. The ISIS system must be able to deploy to stations where there are no airports nearby.

2.4.2 Flexible

Aspects of ISIS that are not specifically identified as required should be considered flexible. Some key examples follow.

2.4.2.1 Radar

The radar frequency bands for surveillance and track are flexible and should be chosen to provide the best performance within the mass and power limitations imposed by the airship. The technologies used for the transmit/receive modules are flexible and should be chosen to optimize performance within the mass limitations.

2.4.2.2 Airship Size

Current manufacturing infrastructure and ground handling techniques limit the airship size. An ISIS system based on an airship larger than the conventional limit may be desirable since it may reduce sensor and power system technology development risk. However, such a concept must include a feasible launch and recovery concept as well as identifying special manufacturing requirements.

2.4.2.3 Aerodynamic Lift and Control Surfaces

Although the ISIS system must be nearly stationary during normal sensor operation, the system may still incorporate aerodynamic lift and control surfaces.

2.4.2.4 Refueling

A completely regenerative power system is desirable since it offers the potential of zero logistics trail. However, the ISIS system may rely on occasional refueling so long as the refueling process is autonomous and does not require significant local infrastructure or personnel.

2.4.2.5 Level of Integration

DARPA believes that ISIS must be a single integrated system. However, the level of integration may range from integrating the sensors and power system inside the airship to integrating the entire sensor and power collection and storage system into the airship skin. The chosen level of integration should be that which maximizes sensor performance and availability within the lift capabilities of the airship.

3 PERFORMER'S ONE-YEAR STUDY

A selected offeror under this BAA becomes a performer that will conduct a one-year concept development and technology risk assessment study. Depending on the results of this study, technology development and system demonstration phases may follow. The following sections describe the performance expected during the one-year study.

3.1 Develop a System Concept

The performer will develop a system concept to the level typically expected during a system CoDR (Concept Design Review). The system concept is not restricted to established or proven technologies, and may include technologies that require significant development. The performer will determine the maximum sensor performance that can be achieved with the ISIS system against airborne and ground targets, and in

communication modes as well as how resources can be re-allocated between these functions. This effort should focus on the sensor performance, sensor calibration, station keeping, power system, and structure. Other sub-systems and functions (e.g. launch and recovery, navigation) should receive an allocation in the system budgets but should not receive a significant portion of the analysis effort.

Sensor performance goals should be translated into high level sensor characteristics such as a concept of operation, RF frequency, aperture area, average radiated power, dynamic antenna calibration accuracy, etc. These results will vary with the assumed sensor technology and architecture and may thus be presented as a series of concepts or a parametric tradeoff analysis. A major architectural decision is the tradeoff between on-board or off-board signal and data processing. A key result from this effort is the sensor size and prime power requirement for a specific performance level.

A station keeping concept of operation and station keeping requirements should be determined consistent with the assumed sensor and airship characteristics. The station keeping requirements should then be translated into propulsion power and total (propulsion and sensor) energy storage requirements. These requirements will be dominated by peak wind events that rarely occur. A brute force concept of operation that requires an absolutely stationary airship during peak wind events may have unrealizable power and energy requirements. A more flexible and creative station keeping concept may be necessary. A design which meets the performance and station keeping goals will then be developed from trade-offs among alternatives.

3.2 Assess System Performance

The performer will develop detailed analysis or simulations to fully characterize the system performance. This analysis should focus on the sensor, station keeping, power system, and structure. Performance estimates should be presented for both normal wind conditions and peak wind events. Detailed power and mass budgets must be developed for the proposed approach. The performer must distinguish between assumed components or technologies that are already developed and those which require development.

3.3 Quantify Technology Development Requirements

Realization of the system concept may require development of new materials, technologies, or designs. These must be identified, and the necessary development results must be quantified. The current state of the art should be clearly compared with the required degree of development.

3.4 Define Technology Development Paths

For each undeveloped technology, material, or component assumed as part of the system concept, the performer will identify possible development paths. The development steps should be outlined and characterized in terms of level of effort, schedule, cost, and risk.

This will not be interpreted by DARPA as a formal proposal to undertake the development described. The identified development paths may extrapolate along established development paths or may postulate completely new technologies. For the more revolutionary developments, it should be shown through analysis that the development goal is feasible within physical bounds.

3.5 Proof-of-Principle Demonstrations

The feasibility of some proposed system concepts cannot be adequately established through a study alone. Offerors are invited to propose necessary proof-of-principal demonstrations of critical technologies. If funded, the performer should complete all hardware demonstrations within the time frame of the one-year study.

3.6 Deliverables

Performers will provide monthly status reports, due within two weeks of the end of each month; quarterly reports, due every quarter (at the time of the Government quarterly review); and a final report, due at the end of this study. The monthly status report will briefly summarize the progress of the research activities during the previous month, including major accomplishments as well as any significant difficulties that have been experienced or are expected. It will identify any aspects of the work that are ahead of or behind schedule. It will track the expenditures of funds, by month and cumulatively, and report actual or anticipated cost overruns or underruns. The quarterly reports will provide a more detailed description of all significant progress since the previous quarterly report, describing results, status, and conclusions to date. It also affords the opportunity to suggest modifications to the previously agreed upon SOW, based on the results to date. The final report will be a cumulative, stand-alone document that describes the work of the entire study. All reports must be delivered in both print format and editable electronic format; the performer may recommend a preferred format for each deliverable, but the Government will have final approval. Quarterly and final reports may consist of both a written report and a briefing to be presented orally at the performers site; monthly reports will consist of only a written document (no oral presentation required).

4 OFFEROR'S INFORMATION

4.1 ISIS BAA Web Site

Offerors may obtain additional information from the ISIS BAA web site <https://dtsn.darpa.mil/isis>. Offerors having difficulty accessing the web site should send email describing the problem to BAA03-36@darpa.mil.

4.2 Industry Briefing

An industry briefing providing additional information to offerors will be held on October 7, 2003. Offerors are encouraged to register for the briefing by September 30, 2003. The

ISIS BAA web site contains registration information. Fifteen minute one-on-one sessions with the ISIS program manager will be available on the day of the Industry Briefing. Offerors should submit their request for a one-on-one session with the ISIS program manager through the ISIS BAA web site. During the one-on-one session no specific program information will be given to individual offerors by the ISIS program manager. A list of industry briefing attendees may be posted on the ISIS BAA web site for public knowledge. A security clearance is not required to attend this briefing, however, U.S. citizenship is required.

4.3 Contact with DARPA

The ISIS BAA web site includes a mechanism to submit questions to DARPA.

4.4 Teaming

Only complete system level studies will be considered for funding. Due to the multiple disciplinary nature of the program, teaming is highly encouraged. Offerors with narrow technical expertise are encouraged to form or join broader teams. The ISIS BAA web site includes a mechanism for offerors to list their teaming interests and qualifications.

4.5 Proposal Classification

Proposals may be entirely unclassified or they may contain classified portions. Proposals must adhere to all security classification guides that apply to the technology included in the proposal. All offerors should consult Department of Defense Instruction S-5230.28 titled "Low Observable and Counter Low Observable Programs". Offerors may not submit completely classified technical proposals. Those portions that require classification should be segregated from the main proposal and submitted separately as described in Section 4.7. Classified pages will be included in the total page count. Contact Mr. Frank Purdy (703-812-1992) with questions concerning security and submission of classified portions of proposals.

4.6 Proposal Preparation Instructions

It is the policy of DARPA to treat all proposals as competitive information, and to disclose the contents only for the purposes of evaluation. The Government intends to use non-Government personnel as special resources to assist with the logistics of administering the proposal evaluation and to provide selected technical assistance related to proposal evaluation. Support personnel are restricted by their contracts from disclosing proposal information for any purpose. Contractor personnel are required to sign Organizational Conflict of Interest and/or Non-Disclosure Agreements. By submission of its proposal, each offeror agrees that proposal information may be disclosed to these selected contractors for the limited purpose stated above. Any information not intended for limited release to support contractors must be clearly marked and segregated from other submitted proposal material.

All data an offeror deems pertinent to a proposal should be submitted with the proposal. Proposals will consist of two volumes: Volume I – Technical Proposal, and Volume II – Cost Proposal. The proposal should be for the one-year study only. Critical technical proof-of-principle demonstrations may be proposed as options within the one-year study, but must be priced separately. Proposals must be submitted in both print and electronic form, as described in Section 4.7. Proposals will be prepared in the following format: single sided, 8.5 by 11 inches, in at least 12 point type, single spaced with margins not less than one inch. Pages must be numbered sequentially.

No specific funding target is provided, although best value to the government will be a selection criterion. The Government intends to select for award those proposals that overall represent a balanced approach to program execution, program approach, risk and proposed cost. The Government may fund no proposed efforts, a portion of a proposed effort, or multiple proposed efforts.

4.6.1 Volume I – Technical Proposal

Volume I will be no longer than 40 pages in length including figures, not including the sections excluded below. Foldouts are counted as a single page and should be no larger than 11 x 17 inches with no more than five foldouts allowed in the proposal. Only the first 40 pages of Volume I proposals will be evaluated. Proposals with fewer than the maximum number of pages are highly encouraged. Clarity in describing the work to be carried out is an important indicator of the ability of the proposer to plan and carry out the work.

The following outline describes the minimum requirements for Volume I and must appear in clearly marked form in the order indicated.

- a) Cover Page *
 - b) Table of Contents *
 - c) Executive Summary
 - d) Technical Approach
 - e) Statement of Work
 - f) Schedule and Milestones *
 - g) Deliverables
 - h) Description of Resources and Facilities
 - i) Key Personnel Summary
 - j) Use of Products
 - k) Organizational Conflict of Interest *
 - l) Appendix A *
- * Items not included in Volume I page limit

4.6.1.1 Cover Page

The Cover Page (not included in the page limit) must include the following information in the order indicated:

BAA number:

BAA 03-36

BAA title:	ISIS
Proposal Title:	(as selected by offeror) Volume I – Technical Proposal
Prime Offeror:	(name of prime)
Proposed Subcontractors:	(listed, if applicable)
Technical Contact:	(name, address, phone/fax, electronic mail address)
Administrative Contact:	(name, address, phone/fax, electronic mail address)
Type of Business:	(large business, small disadvantaged business, other small business, HBCU or MI, other education, or nonprofit)

4.6.1.2 Executive Summary

The executive summary will provide an overview of the proposed study and a brief statement of the work required to develop the approach into a working system. Any outstanding features that the offeror believes distinguish the proposal should be clearly and succinctly identified here.

4.6.1.3 Technical Approach

System Concept Development and Analysis

The proposal should identify the system concepts or approaches that would be developed during the one-year study. The proposal should describe a concept of operations, to include how the system will adapt to changing battlefield conditions by dynamic re-allocation of radar resources between Airborne Moving Target Indication (AMTI) and Ground Moving Target Indication (GMTI), and communications missions and how the system will handle rare high wind events. If more than one conceptual design is to be considered, then the trade studies required to determine the best design should be described. The proposal should also explain how the in-depth system development will be approached during the one-year study. The study should focus on the sensor performance, station keeping, power system, and structure. Other sub-systems and functions (e.g. launch and recovery, navigation) should receive an allocation in the system budgets but should not receive a significant portion of the analysis effort.

System Performance Estimate

The proposer should clearly state the expected system performance in AMTI, GMTI and communication modes including using parameters such as target range, cross section, search volume and frame time, track capacity and update rate, range and angle resolution, communication channels and bandwidth. Additional performance parameters may be stated as appropriate. The proposal should explain how the system concept with the identified components and materials are combined to create a system (within weight, power, and size limitations) that meets the sensor and station keeping performance estimates.

System Performance Assessment

The proposal should describe how ISIS system performance will be assessed during the one year study. The computer simulations and analysis methods used to predict sensor performance should be identified. It should be clearly stated what models currently exist and what models will be developed during the study. The techniques that will be used to determine ISIS's station keeping capability during high wind events should also be presented along with a description of existing models and what models will be developed and what weather data base will be used. The method of developing and verifying detailed weight and power budgets should be explained.

Enabling Technologies Identification

The proposal should identify which technologies require further development to enable the proposed system concept, and should also contain an initial assessment of the degree of development required. The technical maturity of these technologies should be clearly stated. The proposal should explain how this analysis will be further refined during the study.

Technology Development Plan

For the proposed system concept, the proposal should distinguish between assumed components or technologies that are already developed and those which require development. For each undeveloped technology, material, or component assumed as part of the system concept, the proposal should explain why such a technology is feasible. In each case, the proposal should discuss possible development paths.

Hardware Demonstration Options

In addition to the one-year study, separately priced prototype or proof-of-principle hardware demonstrations may be proposed. The proposal should detail these demonstrations and also explain how they contribute to establishing feasibility of the proposed system concept. The schedule for these hardware demonstrations must be shown to fall within the bounds of the one-year study.

Design Team

The successful completion of the ISIS program will require a creative team that includes expertise in many normally unrelated areas. The proposal should clearly show the make up of the technical team, how responsibilities will be assigned, how the activities of the different team members will be coordinated, and how the findings from the different subgroups will be used to create a single ISIS conceptual design by the end of the program.

4.6.1.4 Statement of Work (SOW)

The offeror will provide a SOW written in plain English, describing the proposed plans to carry out the work under this BAA. The SOW will build on the technical approach described in Section 4.6.1.3 and should describe the specific activities the offerors propose in order to carry out the work described in Section 3. The SOW will be divided

into tasks of the offerors' choosing; those tasks should be readily identifiable with the work described in Section 3. They should take particular care to address their technical approach to meeting the ISIS sensor performance requirements within the weight and power limitations of an airship platform, what critical technical development is required, and what that development path will be. They should describe their plan for developing a concept of operation for the ISIS system both in normal and high wind events as well as their plan for developing ISIS system performance estimates.

4.6.1.5 Schedule and Milestones

Proposals will include a schedule (not included in the page limit) for the tasks in the SOW. It will include a graphic illustration showing the major milestones in the SOW arrayed against the proposed time for each task.

4.6.1.6 Deliverables

Proposals will include a list of deliverables, correlated with the corresponding SOW tasks. At a minimum, offerors should include the deliverables listed in Section 3.6.

4.5.1.7 Resources and Facilities

Offerors should identify all resources to be used in carrying out this work, and should specify the availability of those resources for this work. When offerors plan to subcontract with outside organizations not part of the proposal, these organizations, their capabilities, and their commitment to providing the needed support should be clearly identified. Any interactions with or agreements with U.S. Government facilities for this purpose must also be identified.

Classified resources available for this work should be explicitly identified.

4.6.1.8 Key Personnel Summary

Certain skilled, experienced professional and/or technical personnel are essential for successful completion of the work to be performed under this contract. These "Key Personnel" will be identified by name in the proposal, and should include at least one person from each subcontracting organization, as well as the proposed manager of the overall effort. They will be described concisely in a few pages, listing a summary of the qualifications and relevant past efforts of each person, the critical contributions they are expected to make to the effort, their clearance level, and their proposed level of effort.

4.6.1.9 Use of Products

The U.S. Government will have Government Purpose Rights (GPR) and ownership of all reports, data, models, equipment, synthesis plans and prototypes that result from this effort. The Government may choose to disseminate some of the reports and results publicly and may discuss them at conferences and at other public and private meetings. The results may form the basis for subsequent Broad Agency Announcement, Research Announcement, or other solicitations from DARPA or other Government organizations.

The Government expects to retain, at a minimum, Government Purpose Rights (GPR) to all intellectual property (IP) resulting from this effort, including technical data and synthesis plans and device designs, as set forth in DFARS 252.227-7013 and DFARS 252.227-7014. The Government will entertain negotiations for exceptions from GPR, under limited circumstances, as set forth under DFARS 252.227-7013(b) (4) and DFARS 252.227-7014(b) (4). The proposal shall include a summary of any previously existing proprietary claims to results, prototypes, or systems that will play a role in this work, and describe what aspects of existing systems will not be divulged to the Government. If there are no proprietary claims this section will consist of a statement to that effect. Any agreement for work resulting from this BAA will require continual supplementation of said proprietary claims summary. In addition, and where appropriate, Volume II of each proposal will have attached to it the information required by DFARS 252.227-7017, IDENTIFICATION AND ASSERTION OF USE, RELEASE, OR DISCLOSURE RESTRICTIONS (JUN 1995) and/or DFARS 252.227-7028 (JUN 1995) TECHNICAL DATA OR COMPUTER SOFTWARE PREVIOUSLY DELIVERED TO THE GOVERNMENT.

4.6.1.10 Organizational Conflict of Interest

Each proposal will contain a section (not included in the page limit) to comply with the following requirements. All awards made under this BAA are subject to the provisions of the Federal Acquisition Regulation (FAR) Subpart 9.5, Organizational Conflict of Interest. All offerors and proposed subcontractors must affirmatively state whether they are supporting any DARPA technical office(s) through an active contract or subcontract. All affirmations must state which office(s) the offeror supports and identify the prime contract number. Affirmations will be furnished at the time of proposal submission. All facts relevant to the existence or potential existence of organizational conflicts of interest, as that term is defined in FAR 9.501, must be disclosed. This disclosure will include a description of the action the offeror has taken, or proposes to take, to avoid, neutralize or mitigate such conflict. If the offeror believes that no such conflict exists, then it will so state in this section.

Only those offerors whose proposals are expected to result in contract award will be required to submit a completed and signed copy of "Representations, Certifications, and other Statements by Offerors or Quoters." This document is not required for the submission of a proposal unless specifically requested. Offerors are notified that this document is frequently updated and any offeror selected for award may be requested to submit an updated "Representations, Certifications, and Other Statements by Offerors or Quoters."

4.6.1.11 Appendix A

This appendix is not included in the page limit.

- a) **PERSONNEL:** The proposal will include a list of key personnel identified to work on the proposed activity. This list will also include important prime and subcontractor personnel. A concise resume will be provided for each person listed in

this section, describing their qualifications, current clearance level, and the amount of effort committed to this work for each contract year.

- b) **ASSOCIATE CONTRACTOR AGREEMENTS:** Proposals will list all sub-contractor and other agreements existing or planned to support this work, including a description of the status of each such agreement.
- c) **GOVERNMENT FURNISHED PROPERTY/EQUIPMENT:** If any portion of the research is predicated upon the use of Government owned resources of any type, the offeror will specifically identify the property or other resource required, the date the property or resource is required, the duration of the requirement, the source from which the resource is required, if known, and the impact on the research if the resource cannot be provided. If no Government Furnished Property is required to conduct the proposed research, this section will consist of a statement to that effect.

4.6.2 Volume II – Cost Proposal

Cost proposals have no page-length limitations; however, offerors are requested to keep cost proposals to approximately 15 pages. The electronic version of the Cost Proposal must be contained on the same CD-ROM, Zip disk, or diskette that contains the Technical Proposal, and any electronic spreadsheets must be submitted in a format usable in Microsoft Excel.

The Cost Proposal must contain the following sections, in the order listed:

- Cover Page
- Table of Contents
- Budget Summary
- Budget Details
- Details of any cost sharing by the offeror (if proposed)
- In addition, each cost proposal will contain a section that identifies the offeror's Taxpayer's Identification Number (TIN), DFARS 204.7202-3; Corporate and Government Entity (CAGE) code, DFARS 204.7202-1; and Contractor Establishment Code (CEC), DFARS 204.7202-2. The codes provided will be those of the offeror and not of the principal place of performance, if the two are different.

4.6.2.1 Cover Page

The Cover Page is the same as that for Volume I/Technical Proposal (see Section 7.1.1), except that item (d) will read "Volume II – Cost Proposal".

4.6.2.2 Budget Summary

The budget summary must show: the cost for each task identified in the SOW of the Technical Proposal, including the manpower levels of effort (labor hours and rates listed by labor category) by task; cost of equipment, travel, G&A, and all other expenses. The sum of these task costs must equal the total proposed cost. Costs for team members or

other subcontractors must be clearly identified under the appropriate tasks, and the net amount proposed for each organization must also be separately and clearly labeled.

4.6.2.3 Budget Details

The cost will be specified in detail, showing the information below as well as a monthly spending plan. The monthly cost roll-up is critical to DARPA budget planning.

Labor hours and rates for each labor category, divided into the tasks and subtask areas identified in the SOW, Volume I. Optional tasks/subtask areas must be listed individually and priced separately.

- Personnel (name or designation, rate in dollars per labor hour, and percent time on project).
- Total cost by task/subtask identified in the SOW/Volume I.
- Total cost by labor category, with subtotals for each task.
- Proposed contractor-acquired equipment, itemized with costs or estimated costs. An explanation of any estimating factors, including their derivation and application, must be provided. Include under “Budget Details” a brief description of the procurement method to be used.
- Travel costs.
- Materials costs.
- Other direct/indirect costs.
- Subcontractor costs (net)
- Any other information important for supplementing the Budget Summary for Phase I.

Note that each subcontractor should provide a cost breakdown that is similarly detailed. This may be submitted as part of the prime contractor proposal, or it may be submitted directly to the Government (see Section 4.7); in the latter case, the cover page of the subcontractor’s proposal must clearly identify the proposal to which it belongs.

4.7 Proposal Submission

Offerors must submit an original (paper) proposal consisting of Volumes I and II, five (5) paper copies and an electronic copy on one of the following types of approved fixed media: a single CD-ROM; a single 100 Megabyte (MB) Iomega Zip® disk; or a single 3.5 inch High Density MS-DOS -formatted 1.44 MB diskette. The printed versions must be bound; ring binders will not be accepted. The fixed media must contain the technical proposal in MS Word or HTML format and the cost proposal in MS Excel-readable format; both must reference BAA 03-36. To be considered, proposals must be received by 1600 E.S.T., November 10, 2003. Proposals should be mailed to DARPA, ATTN: Dr. Larry Corey /BAA 03-36/Document Control, 3701 N. Fairfax, Drive, Arlington, VA 22203. If appropriate, offerors must segregate out any portion of their proposal that is classified and submit that portion separately. Prior to submitting the classified portion of a proposal, the offeror must contact DARPA (see section 4.5) to obtain instructions for submission. Entire proposals that are classified will not be accepted.

4.8 Proposal Evaluation

4.8.1 Evaluators

It is the policy of DARPA to treat all proposals as competitive information and to disclose the contents only for the purposes of evaluation. The Government evaluation team will consist of Government personnel from DARPA and other Government agencies. For this solicitation, non-Government advisors, who have signed appropriate non-disclosure and conflict of interest statements, may assist in the proposal administration and review process when their particular expertise is required; however, they will not participate in the final source selection decision. The Government intends to select for award the proposals that overall represent a balanced approach to program execution, program approach, risk and proposed cost.

4.8.2 Evaluation Criteria

Evaluation of proposals will be performed using the following criteria:

- Scientific and Technical merit
- Offeror Qualifications
- Cost Realism

4.8.2.1 Scientific and Technical Merit

The evaluation will consider whether the proposed study fully encompasses all critical aspects of the airship and sensor systems, and whether the system approach and technologies proposed for study appear likely to support a future integrated sensor-airship system that meets the ISIS system performance goals. The risk/payoff of the selected approach and the risk/payoff of technology development required to enable the selected approach will be considered although not necessarily adversely. Innovation relative to conventional approaches and relative to other proposed approaches will be considered. The feasibility of some proposed system concepts cannot be adequately established through a study alone. Offerors are invited to propose necessary proof-of-principle demonstrations of critical technologies. If funded, the performer should complete all hardware demonstrations within the time frame of the one-year study.

4.8.2.2 Offeror Qualifications

The evaluation will consider the capabilities of the offeror to perform the proposed study. The offerors team should include expertise, prior experience, and other necessary resources (e.g. computer simulation tools) in each technology area involved in the proposed study. The team should also include system engineering expertise and resources. The soundness of the proposed management plan will also be considered.

4.8.2.3 Cost Realism

Cost will be evaluated to determine whether the offerors estimate is realistic for the technical and management approach offered. This is necessary to gauge the offerors practical understanding of the effort and to estimate the likelihood that the proposed effort can be completed with the proposed funding. Affordability will also be considered during proposal evaluation.

4.8.3 Awards

Offerors are advised that only contracting officers are legally authorized to contractually bind or otherwise commit the Government. The Government reserves the right to select for award all, some, or none of the proposals received in response to this announcement. Awards may be traditional FAR/DFARS contracts, grants, cooperative agreements, and/or Other Transaction Agreements. The Government is seeking participation from the widest number of offerors. All responsible sources may submit a proposal, which will be considered by the Government. Historically Black Colleges and Universities (HBCU) and Minority Institutions (MI) are encouraged to submit proposals or to team with others in submitting proposals; however, no portion of this BAA is set-aside for HBCU and MI participation, due to the impracticality of reserving discrete or severable areas of technology for exclusive competition among these entities.

4.9 Schedule Summary

The anticipated schedule is given below. Changes to the solicitation dates will be posted on the ISIS BAA web site.

Table 1. Tentative schedule of events and deadlines associated with BAA 03-36.

DATE	EVENT
September 24, 2003	FedBizOpps announcement published.
October 7, 2003	Industry Briefing.
November 10, 2003	Proposals due.